Towards an inclusive knowledge society in Italy

FONDAZIONE Mondo Digitale

Towards an Inclusive Knowledge Society in Italy

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Foreword

Tullio De Mauro

I have already pointed out – in the pertinent technical arenas - that Alfonso Molina's annual reports provide us with the most comprehensive range of analytical data for an up-to-date overview of empowerment and development, in terms of ICT, in Italy and particularly for the city of Rome and the Lazio Region. The data, especially that concerning Rome, is profoundly related to the activities currently promoted and implemented by the Fondazione Mondo Digitale and formerly by its progenitor, the Gioventù Digitale, a public-private consortium. The majority of the data presented in this report, as is often indicated, has been painstakingly produced, through steadfast research, comparison and re-elaboration, by a scholar who has wisely employed diverse primary sources to obtain the overall panorama that I mentioned above.

This research project was assigned to Prof. Molina on account of the increasing number of activities conducted by the Foundation. Our experience in this field has revealed the need for a greater general reflection on ICT, on its role in modern society and its development in Italy, as well as on our inspiring philosophy, which regards the development of ICT as an essential catalyst not only for economic and productive growth, but also for the evolution of a society truly embodying equal opportunities and the inclusion of all women and men in the minimal conditions required to actively thrive in a modern knowledge society. In other words, ICT appears to be not only an indispensable accessory to productive growth, but also a fundamental element for a full democratic life in society.

The picture that Molina delineates is not reassuring when compared against the international panorama. With the exception of the enormous development of private mobile telephony, which in Italy seems to have

become essential across all age groups and social levels, every other indicator places our country at the lowest levels compared to other EU and non-EU nations. The cities and surrounding environs of Milan and Rome represent a partial exception to this, a testimony to the fact that the underdevelopment of ICT may be remedied. Moreover, this also presents an interesting correlation with increase in income and a higher degree of cultural life. The case of Rome is particularly interesting as its initial economic-productive conditions were far inferior to those of Milan. The area of Rome is similar to others around the planet, from the gelid lands of the Inuit to the sweltering heat of India, in which the introduction and development of ICT have represented an autonomous element, an independent variable stimulating and nourishing growth. There is hope for all of Italy if this has occurred in Rome and Lazio.

However, with the exception of this positive glimmer, the overall picture provided by Molina's data is not reassuring. It is also, nonetheless, not as hopeless as some might believe. Molina's picture leaves the background of profound causes related to the national difficulties in terms of ICT expansion in an implicit penumbra. In a work that Molina graciously mentions[1], I tried to account for these causes, which include post-elementary school system deficiencies (highlighted as early as 1971 by the first international comparative survey on the results of the scholastic system produced by the Institute of International Achievement as well as by subsequent IEA and OECD surveys, by the Istituto Cattaneo[2] in 1996 and more recently by the tri-annual surveys of PISA (Programme of International Student Assessment); the low number and average quality of university courses of study (which Molina justly addresses); the lack of public reading facilities and multimedia libraries to spark interest in culture and, as happens elsewhere, efficiently integrate the activities of schools and teachers; and the absence of a national adult education and training system, allowing not only the instruction of the unschooled, but especially the continuous improvement throughout adult life of all the competencies and skills acquired in schools and universities. This condition has been denounced by UNLA (Unione Nazionale Lotta all'Analfabetismo, a national union fighting illiteracy), OECD and the TreElle-Life Long Learning Association, but to no avail judging by the continued lack of attention paid by the political, the entrepreneurial

1 Dislivelli linguistici nell'Italia d'oggi, Cristina Bosisio et alii (edd.), Aspetti linguistici della comunicazione pubblica e istituzionale, Atti del 7° congresso AItLA-Associazione Italiana di Linguistica Applicata, Milan 22-23 February 2007, Guerra Edizioni, Perugia 2008, pp.41-66.

2 Giancarlo Gasperoni, Diplomati e istruiti. Rendimento scolastico e istruzione secondaria superiore. Ricerche dell'Istituto Cattaneo, Il Mulino, Bologna 1996

and the managerial world at large. The result is the low level of literacy, numeracy and problem-solving capabilities demonstrated by the working age (16-65) adult population of Italy. Up to ten years ago, this condition was merely an inference, extrapolated from data concerning middle and high school level students as well as information regarding newspaper and book reading levels. Now, however, this situation has been ascertained by two subsequent and accurate international surveys that also scrutinized Italy. Once again, even the Italian version of the surveys received very little attention[3]. Indeed, these results should resound an alarm for the entire executive class. Notwithstanding the fact that school registries indicate that the phenomenon of total illiteracy has practically disappeared, 5% of the adult population (two million people) is hampered by a complete lack of literacy and numeracy. These individuals are not capable of deciphering phrases or numbers, nor are they able to reproduce them. I will not dwell on the bad quality and vast portions of the population affected by relatively less serious deficits that, nonetheless, preclude them from understanding and producing written texts and numbers. I would, however, like to remind you of the bitter conclusion reached by the second and more recent survey: only 20% of the adult Italian population possesses the minimum competencies necessary to orient itself in everyday modern society. At the international level, Italy places first-to-last (only Sierra Leone produces worse results) and at an enormous distance from all the other examined nations. Pockets of incompetence regarding literacy and numeracy can be found in all developed countries and everywhere they pose problems concerning inclusion, but no industrialized country has pockets so dilated that they engulf half of the population, let alone the 80% registered in Italy.

Is this data too pessimistic? Based on the data provided by the last multi-scope Istat (the Italian national statistics institute) survey on culture and leisure time and with the help of a talented young Istat executive, Adolfo Morrone, we devised a research project that pursues various channels. The project seeks to make sense of all the answers provided by different questionnaires aimed at understanding and quantifying the population groups that converge towards the highest level of competencies, skills and cultural habits or, inversely, that suffer from a series of deficits. The survey, which is nearing its conclusion, provides us with a far more positive outlook: 30% of

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3 Vittoria Gallina (edited by), La competenza alfabetica in Italia. Una ricerca sulla cultura della popolazione, Franco Angeli, Milan 2000 [a partire dall'indagine OCSE-IALS, International Adult Literacy Studies]; Eadem (edited by), Letteratismo e abilità per la vita. Indagine nazionale sulla popolazione italiana 16-65 anni, Armando editore, Rome 2006

the adult population (above age 14) possesses a good cultural competency. Dropouts from active life and participation in modern society are only 70%, not 80%.

Moreover, this result may be somewhat improved upon by a careful analysis of this survey. A careful analysis of the data concerning book reading (data gathered by Istat, Mondadori and others) or that concerning attendance of scientific conference series, reveals a positive margin between acquired and consolidated competencies and habits and practical aspirations to improve them. Based on the 20% figure observed by surveys on literacy and numeracy and the 30% figure for people who demonstrate good-level cultural competencies and habits, we may venture to propose a total figure of nearly 40% by also including all those who aspire to a higher level than they presently possess. There is a precious 10% that calls for mobilization.

Assinform and other agencies are surprised by the fact that following the great race towards public and private ICT integration, in the mid-nineties everything seemed to come to a halt. Those who own a PC and use it as a tool to search for information, to acquire documents, news, music and movies, in other words, those who profitably make use of Internet are less than 40%. However, in order to resolve the issue of ICT illiteracy, we must also tackle the issues of literacy and numeracy. The digital divide, the personal and social gap concerning ICT, is the natural consequence of the generally low culture at the national level.

Operating on the frontier of the digital divide, as our Foundation has for so many years, and many other institutions should, entails working to improve the basic cultural level and increase the ability to fully enjoy the tools that are available for orienting one's life in a complex society. Alas, the Foundation only has limited forces with which to tackle the vast mass of cultural and technological outcasts. We have no delusions of grandeur. We simply want to demonstrate, through our experiences, that this divide can be successfully bridge when and if, as we try to do, the necessary stimuli and conditions are induced. This is the spirit with which we present our initiatives and activities for reflection through this vast survey for which we are grateful to Professor Alfonso Molina.

Towards an Inclusive Knowledge Society in Italy – Report 2008

1 Introduction

Countries and regions in the world are facing the development of the knowledge society.[1] Enormous opportunities and challenges are at stake and the way societies respond today will determine their development for many years to come. The defining characteristic of the knowledge society is the primacy of knowledge, learning, information and communications technologies ICTs), globalization,[2] dynamic capabilities[3] and innovation. This suggests a dialectics of creative destruction and construction that challenges societal institutions to innovate to be able to benefit from the transforming world rather than being swept aside by it. This calls upon the leadership distributed in society to envision and pursue the changes that will result in the best-possible knowledge society for the present and future generations.

1 In 1968, Peter Drucker first used the term "knowledge society" to indicate the rise to primacy in society's development of the capacity of "learning how to learn". (Drucker, 1969) About the same time other authors used the term "learning society" to indicate how society was evolving towards the requirement for "life-long learning." (Hutchins, 1968 and Husén, 1974) Since then much has been written on "knowledge" and "learning" societies, sometimes with economic emphasis and with the purpose of assessing the comparative knowledge-society development of different countries. For instance, the UN (2005) report on knowledge societies points to the increased interest in knowledge as a factor for growth and development, which has led to the bestowing of "the term "Knowledge Economy"/"Knowledge Society" on countries with economies featuring a relatively large and growing service sector or on economies in which manipulation of information and creation of knowledge replace industrial production as the main contributor to GDP." (UN, 2005, p.23). On the other hand, UNESCO (2005) gives a more holistic societal content to the concept of "knowledge society," emphasizing particularly human development for all. Thus, "Knowledge societies are about capabilities to identify, produce, process, transform, disseminate and use information to build and apply knowledge for human development. They require an empowering social vision that encompasses plurality, inclusion, solidarity and participation." (p.27)

2 Globalization is here understood as the constant tendency for peoples, economies and cultures of the world to come into contact and interaction regardless of whether this leads to mutual benefit or conflict.

3 "We define dynamic capabilities as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization's ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions." (Teece, et al., 1997, p.516) Also, " 'dynamic capabilities' contrast with ordinary (or 'operational') capabilities by being concerned with change." (Winter, 2003, p.992)

In this paper such best-possible knowledge society is a society for the benefit of all, or, an *inclusive knowledge society* in which the opportunities and fruits of knowledge, new technology and innovation in all walks of life, including industry, health, education and culture, accrue to all citizens without discrimination of any kind. As the UNESCO's 2005 World Report has put it:

> A knowledge society should be able to integrate all its members and to promote new forms of solidarity involving both present and future generations. Nobody should be excluded from knowledge societies, where knowledge is a public good, available to each and every individual. (UNESCO, 2005, p.18)

The Fondazione Mondo Digitale seeks to contribute to the dream of an inclusive knowledge society,[4] through the establishment of a synergistic virtuous dynamics among key factors that can be grouped under the general dimensions of education, innovation, inclusion and fundamental values. Figure 1 and Table 1 illustrate this concept.

Figure 1. Virtuous Dynamics of an Inclusive Knowledge Society

4 *See Molina, A., Digital World Foundation, Working for an Inclusive Knowledge Society, Fondazione Mondo Digitale, Roma, 2007. An electronic version of this book can be downloaded free of charge from the website lulu.com.*

Table 1. Elements of a Virtuous Dynamics of an Inclusive Knowledge Society	
Education	Includes knowledge, skills, competences and learning at all levels and contents, in formal or informal institutional settings and for life – very much related to what has become known as 21st century skills, i.e., those skills necessary for successful human development in the knowledge society.
Innovation	Includes new technologies and particularly the mastery of information and communication technologies (i.e., creation, production, diffusion, implementation and use) for wealth creation, growth and enrichment of activities in all walks of life and work. It also contains dynamic capabilities and entrepreneurship to stress the point that the effective pursuit of innovation in the knowledge society requires continuous improvement of individual and organizational capacities to innovate, along with the capacity to transform innovation into sustainable enterprises.
Inclusion (and its ICT-based expression e-inclusion)	Includes equal access and opportunities, participation and di- and multi-alogue to make the point that equality of access and opportunities effectively means participation in the decision-making and benefits of the knowledge society, sustained by bilateral and multi-lateral communication and profound respect for the dignity of people.
Fundamental Values	Includes fundamental virtuous values such as freedom, justice and peace, equality of opportunities, solidarity and fraternity, achievement, fair competition and cooperation.

The borders between education and innovation are completely porous insofar as knowledge, skills, competences and learning are fundamental to innovation processes, in the same way as creativity and research belong to both, and innovation is fundamental to the evolution of education towards 21st century skills. Likewise, inclusion (e-inclusion) in the knowledge society is impossible without education and innovation for the benefit of all and, conversely, without inclusion the latter are unlikely ever to lead to the elimination of the scourges of poverty, disease, hatred and war that prevail in present societies. Last but not least, fundamental values are the ultimate source and force of an education and innovation for the benefit of all peoples and the planet and, conversely, the latter should help nurture and promote these values as the fundamental source and force of an inclusive human development.

In the following, this report presents an overview of the state of development of Italy with particular focus on regarding innovation, education and inclusion.

2 Italy and the Challenge of an Inclusive Knowledge Society

Since the publication of the first version of the book *The Digital World Foundation* (Molina, 2007), little has changed for Italy's progress towards the knowledge society. There was a significant increase of 1.9% in the country's GDP in 2006, over the zero growth of 2005, but the momentum was immediately lost in 2007 with a GDP growth of 1.5% and growth estimates for 2008 pointing downwards to less than 1%. This tends to support the prediction of *The Economist Intelligence Unit* (2006) of an estimated 1.5% GDP average annual growth between 2006 and 2010 accompanied by an estimated GDP per capita average annual growth of 1.5% for the same period. The 2006-2007 GDP growth improvements, however, along with some measures of liberalization implemented in the same period, helped improve slightly Italy's position in the World Economic Forum's index of global competitiveness to 46th place in 2007-2008 from 47th place in 2006-2007.[5] Even more positive is the 2007 IMD's world competitiveness ranking that shows Italy climbing to 42nd place from 48th place in 2006 in a list of 55 countries.[6]

The following sections review in detail the performance of Italy in response to the challenges posed by the key dimensions of an inclusive knowledge society, namely, innovation, education and inclusion.

2.1 Innovation in Italy

Italy is badly in need of a culture of innovation in order to break out of the present path to relative economic decline in the world. All major sectors of society agree with this need yet the challenge remains huge given that many of the structural indicators associated with innovation in the knowledge society continue show a very unfavourable situation. Table 2 provides a wide range of indicators concerning Italy's performance in innovation.

5 *Porter et al. (2007).*
6 *IMD (2007).*

Table 2. Various Indicators Relevant to Innovation

Indicator		*Year*	*Value*	*Rank*	*European Reference*	*Top Performer*	*Worst Performer*
1	Global Innovation Performance (Index)	2006	0.36	26 out of 48	EU25 Value 0.50	Finland Value 0.76	Romania Value 0.11
2	European Innovation Scoreboard	2007	0.33	23 out of 37	EU 25 Value 0.45	Sweden Value 0.73	Turkey Value 0.08
3	Multi-factor Productivity (average annual growth %)	2001-2006	-0.5	19 out 19	-	Ireland 2.4	Italy
4	Labour Productivity (GDP / hour worked) (average annual growth)	2001-2005	0.0%	29 out 29	EU 15 - 1.3 %	Slovak Repub. 5.2%	Italy
5	Investment in Knowledge (% of GDP)	2003	2.38	15 out of 18	EU 3.6	USA (2004) 6.56	Portugal 1.74
6	Gross Domestic Expenditure on R&D (% of GDP)	2005	1.1	24 out of 33	EU 27 1.7	Sweden 3.9	Mexico 0.5
7	Business R&D Intensity (% industry value added)	2006	0.8%	23 out of 32	EU 27 1.6	Sweden (2005 4.6	Greece (2005) 0.2
8	Government R&D Budgets – Defense and Civil (% of GDP)	2006	0.6	18 out of 30	EU 27 0.7	Iceland (2005) 1.4	Mexico 0.2
9	Researcher (per 1000 employed, FTE)	2004	2.9 1.1 Industry 1.8 Others	28 out of 31	EU 27 5.8	Finland (2005) 16.5	Mexico (2005) 1.2

10	Triadic Patents Families[a] (number per million of population)	2005	12.2	22 out of 37	EU 15 32.4	Japan 119.3	India 0.1
11	Size of ICT Sector (% Share in Value Added)	2003	11.9	19 out 24	OECD 15.6	Finland 33.4	Greece 7.6
12	Size of ICT in Manufacturing (% of total manuf. value added)	2003	4.0	19 out 25	OECD 6.5	Finland 22.2	Greece 1.2
13	Investment in ICT (% of gross fixed capital formation)	2006	10.7	20 out of 22	-	US 26.5	Ireland 7.7%
14	Business R&D Expenditure by Selected ICT Manufac. Indus. (% GDP)	2004	0.09	15 out of 19	-	Finland 1.27	Poland 0.01
15	Business R&D Expend. by Selected ICT Service Industry (% GDP)	2004	0.03	14 out of 15	-	Finland 0.30	Poland 0.01
16	ICT Goods Trade (% Share of Total Trade)	2005	6	26 out of 30	OECD 13	Korea 25	Norway 5
17	ICT Goods Trade Balance (% Share of Total Trade)	2005	-3.78	22 out 30	OECD -0.30	Korea 12.64	Australia -10.89
18	Exports of ICT Equipment (US $ Millions)	2006	15,386	14 out of 35	OECD Total 931,882	China 298,993	Iceland 16
19	IT Expenditure by Public Administrations as % of GDP	2004	0.16 2,951 € Mn	15 out of 18	-	Sweden 0.60	Ireland 0.13

20	IT Expenditure / Inhab. by Public Administrat.	2004	51.3	12 out of 16	-	Sweden 254.8	Greece 26.8
21	Exports of Hi-Tech Industries (% of Total Manufacturing Exports of Goods)	2003	11%	23 out of 29	EU 15 22.1	Ireland 53.6 %	Iceland 5.1 %
22	Technology Balance of Payments (% of GDP)	2005	-0.02	15 out of 26	-	Luxembourg (2004)	Ireland -9.41
23	Venture Capital Investment (% of GDP)	2005	0.031	23 out of 27	EU 0.11	Denmark 0.4	Greece 0.001
24	Foreign Direct Investment (US$ Mn) Average 2004-2006	2004-2006	17,790	12 out 35	EU 15 447,466	USA 142,162	Ireland -9.636
25	Foreign Direct Investment (% GDP) Average 2000-2005	2000-2005	1.1	26 out of 29	-	Belgium (2002-05) 9.7	Japan 0.2

(a) "Triadic patent families are a set of patents taken at all three of these major patent offices – the European Patent Office (EPO), the Japanese Patent Office (JPO) and the United States Patent and Trademark Office (USPTO)." (OECD, FactBook 2006, p.134)

Source. OECD (2006, 2007a, 2007b, 2008), Merit and JRC (2007, 2008), AITech-Assinform (2006, 2007), Hollanders and Arundel (2006), Economist Intelligence Unit (2007b).

The Table places Italy's performance in relation to other countries, mostly inside the EU and the OECD. All indicators are strikingly consistent in highlighting Italy's structural weakness. The first two rows, for instance, shows Italy well down in the league of innovation performance and far away from the top performers, Finland and Sweden. In fact, the European Innovation Scoreboard 2007 places Italy amongst the group of *moderate innovators*, ahead *of catching-up countries* but behind the groups of *innovation leaders* and *innovation followers*. (Merit and JRC, 2008)

All subsequent indicators in rows 3 to 10 follow the same pattern, namely, productivity, investments in knowledge and R&D, number of researchers, patents. Here only the government R&D budget is close to the EU 27 average. Then, the data in rows 11 to 20 of Table 2 concentrate on the relative country's performance regarding information and communication technologies (ICTs), since these are at the heart of the evolving knowledge society. The pattern of structural weakness is very clear in this critical area too. Italy is towards the bottom of the league in size of the ICT sector, ICT investment, R&D expenditure by ICT manufacturers and services, trade of ICT goods and ICT goods trade balance where the country shows a negative share of total trade at -3.78. The best in this poor situation is exports of ICT equipment with a 14th position within a group of 34 countries. Rows 19 and 20 focus specifically on the role of government in the ICT sector, since government expenditure is an important factor for the development of the industry. Here, in 2004, Italy was again well down the league in IT expenditure as percentage of GDP and as IT expenditure per inhabitant. The top performer Sweden spent about 4 times more than Italy as percentage of GDP and about 5 times per inhabitant. Moreover, in Italy the IT expenditure by the central public administration fell by 4.8% between 2005 and 2006, from €1,701 Mn to €1,620 Mn (AITech-Assinform, 2007). Not surprisingly, a recent report by *The Economist* (14 February 2008) places Italy among lowest group of "slow movers" countries in e-government with expenditure of 0.6% of GDP and less than 15% usage by individuals in 2005. Sweden ranks the best with e-government expenditure of 1.2% of GDP and over 50% usage by individuals. Sweden is also ranked top in the latest UN e-Government Report 2008 with an e-Government Readiness Index of 0.9157, whilst Italy is ranked 27 in the group of top 35 countries with an index of 0.6680.

Finally, the indicators in rows 21 to 25 consider not just ICT but all hi-tech industries, the overall technology balance of payments, as well as capital investments both by venture capital and direct foreign investment. These

show that Italy is in 23rd place out of 29 countries with an 11 percent share of total manufacturing exports of goods, against an EU 15 average of 22.1% and a 53.6% by top performer Ireland; whereas the overall technology balance of payments is negative at -0.02% of GDP. Regarding the availability of venture capital, this stands at 0.031% of GDP, about one-third of the EU average of 0.11%, and one-thirteenth of Denmark's 0.4% of GDP. Foreign direct investment is also low, reaching an average of US$ 17,790 Mn between 2004 and 2006 and growing by an average of just 1.1% of GDP between 2000 and 2005. The latter placed Italy in 26th place out of a group of 29 countries. The Economist Intelligence Unit (2007b) identifies the quality of the business environment as an important factor in attracting foreign direct investment. Its ranking of the top 20 countries for the period 2007-2011 does not include Italy.[7] All these results amount to an Italy largely stagnant, an Italy where innovation finds it difficult to flourish, and for the same reason an Italy in need of systemic innovation.

Table 3 gives an idea of how the country is performing in relation to its population's access to telephony, computers and Internet and enterprises' access to broadband connectivity.

Table 3. Indicators Relevant to ICT Access by the Population and Enterprises

Indicator	*Year*	*Value*	*Rank*	*European Reference*	*Top Performer*	*Worst Performer*
Total Telephone Subscribers (per 100 inhabitants	2006	181.39	1 out of 48	Europe 141.46	Italy	Malta 56.64
Mobile Cellular Subscribers (per 100 inhabitants)	2006	135.14	2 out of 48	Europe 98.46	Lithuania 138.06	Moldova 32.38 (a)
Households with Access to Home Computers (% of all households)	2006	47.6	24 out of 30	EU 25 61.5	Denmark 84.8	Turkey 12.2 (2005)

7 *The Economist Intelligence Unit (2007b) also places Italy in 10th place in terms of average FDI flows for the period 2007-2011, with US$41.6 bn or 2.77% of the world total. The top performance goes to the US with US$ 250.9 bn or 16.75% of world total. The same source, however, places Italy in 23rd place out of a group of 30 countries in terms of new FDI projects, an indicator that reflects greenfield investments and excludes investment due to crossborder mergers and acquisitions. In 2006, Italy accounted for 138 projects or 1.17% share of the world total, a figure that implied a 1.4% fall in relation to 2005.*

Share of Individuals Who Have Never Used a Computer (% of total Aged 16 to 74)	2005	56	3 out of 24	EU 25 34	Sweden 8	EL 65
Share of Individuals Using the Internet at Least Once a Week on Average (%)	2007	34	25 out of 28	EU 27 51	Iceland 86	Romania 22
Internet Access at Home (% households)	2007	43	20 out of 28	54	Iceland 84	Bulgaria 19
Broadband Penetration Rate (No. of broadband lines subscribed as % of the population)	2007	15.9	13 out of 27	EU 27 18.2	Denmark 37.2	Bulgaria 5.7
Broadband Access (% Households)	2007	25	24 out of 28	EU 27 42	Iceland 76	Greece 7
Share of enterprises with Internet access (%)	2007	94	14 out of 27 (along with 4 others)	EU 27 93	Finland 99	Romania 67
Share of enterprises with broadband access (%)	2007	76	18 out of 27 (along with two others)	EU 27 77	Finland 91	Romania 37

Source. ITU (2007a, 2007b), OECD (2007b), Eurostat (2008)
(a) There is a suspect last place for the Netherlands with 1.06 subscribers per 100 inhabitants. In the ITU data. Eurostat statistics give the Netherlands 97 subscribers per 100 inhabitants. Moldova is second last in the ITU data.

In a clear break with the general pattern of low performance, according to the ITU (2007a), Italy was the top performer in terms of total telephone subscribers per 100 inhabitants in 2006. Its value of 181.39 was well above the average of 141.46 reached by Europe. In mobile telephony, according the ITU (2007b), Italy was second in Europe with 135.14 subscriptions per 100 inhabitants, again significantly above the European average of 98.46 subscriptions.

This positive performance in telephony changes significantly once we consider computers and Internet access, particularly broadband, by the population and enterprises.

Thus, in 2006, 47.6% of Italian households had access to computers, compared with an average of 61.5% for the EU25 and 84.8% for the leader Denmark. This ranked Italy 24 out of a group of 30 countries. Likewise, in 2005, Italy ranked 3 out of 24 when considering the share of individuals aged 16 to 74 who have never used a computer. Fifty six percent of Italians fall within this category, against an average of 34% for the EU 25 and only 8% for top performer Sweden. This pattern of underperformance is replicated in Internet. Thus, in 2007, the share of individuals regularly using Internet (at least once a week) was 34%, much less that the EU27 average of 51% and far away from Iceland's 86%. In the same year, 43% of households had Internet access, putting Italy in 20th place out 28 countries, behind the EU27 average of 54% and well behind Iceland with its 84% Internet access. Considering access to broadband connectivity, in 2007, the penetration rate in Italy was 15.9%, whereas the EU27 average was 18.2%, and Denmark's top rate was 37.2%. Similarly, the share of Italian households having broadband access in 2007 was 25%, against the EU27 average of 42% and Iceland's 76%, ranking Italy 24 out of 28 countries.

On the other hand, Italian enterprises do much better in terms of Internet access with 94% having Internet in 2007, slightly higher than the EU27 average of 93% but lower than the 99% of top performer Finland. This put Italy in 14th place out of 27 countries along with four others. A similar picture emerges regarding broadband connectivity where Italy with its 76% performs slightly below the EU27 average of 77% and further below the 91% exhibited by Finland. Here Italy ranks 18 out of 27 countries.

These results can be seen along with those of studies that seek to rank countries by their degree of preparedness to participate in and benefit from ICT developments such as the "networked readiness index" of the World Economic Forum or the e-readiness rankings from the Economist Intelligence Unit. In terms of networked readiness Italy is ranked 38 in the world in 2007 (Dutta and Mia, 2007) while the 2008 e-readiness ranking places it 25 out of a group of 70 countries with a score of 7.55 in a scale of 10, against a score of 8.95 by the leading country, United States. Italy's 25th ranking remained unchanged from 2007 but its score increased slightly from 7.45 (EIU, 2007a, 2008).

2.2 Education in Italy

Education is at the core of countries' capacity to advance towards an inclusive knowledge society. Italy's performance, however, gives much reason for preoccupation because results in a range of indicators depict a situation of serious weaknesses in relation to other nations in the world. Table 4 provides more detailed data confirming Italy's educational underperformance.

Table 4. Italy's Relative Educational Performance – Various indicators

Indicator		*Year*	*Value*	*Rank*	*Reference*	*Top performer*
1	Total Expenditure on Educational Institutions for all Levels of Education (% of GDP)	2004	4.9	23 out of 34	OECD Average 5.8	Israel 8.3
2	Upper Secondary Attainment– population aged 25 to 64 (%)	2006	51.3	25 out of 28	EU 27 70	Czech Republic 90.3
3	Youth Education Attainment - % of Population aged 20 to 24 with at least upper secondary education	2006	75.5	24 out of 32	EU 27 77.9	Croatia 94.6
4	Tertiary Attainment for Age Group 25-64 (% of population of that group)	2005	12	34 out of 36	OECD average 26	Russian Federation 55
5	Tertiary Attainment for Age Group 25-34 (% of population of that group)	2005	16	33 out of 36	OECD Average 32	Russian Federation 56
6	Tertiary Graduates in Science and Tech. aged 20-29 years (per 1000 of population)	2005	9.7	25 out of 35	EU 27 12.9	Ireland 24.5
7	Life-long learning (% of adult population aged 25 to 64 participating in education and training	2006	6.1	17 out of 28	EU27 9.6	Denmark 29.2
Position of Italian Universities in Various World Rankings						
Source		***Year***	***University***	***Rank***	***Italian Presence***	***Top Performer***
8	Times Higher Education (THES) -Top 200 Universities in the World	2007	University of Bologna	173	2 from Italy (also La Sapienza Rome at post 183)	Harvard University (USA)

9	THES–Top 50 Technology Universities in the World	2007	None	-	Polytechnic University (Milan) at post 63 in 2006	MIT (USA)
10	THES – Top 50 Science Universities in the World	2007	None	-	La Sapienza Rome at post 30 in 2006	Cambridge University (UK)
11	Shanghai Jiao Tong – Academic Ranking of Top 100 World Universities	2007	None	-	3 from Italy in range 102-150 Milan University Pisa University La Sapienza Rome	Harvard Univ (USA)
12	FT – Top 60 Business Schools in Europe	2007	SDA Bocconi	19	Only 1 from Italy	HEC Paris
13	FT - Top 100 Full-time MBA Programmes	2008	SDA Bocconi	48	Only 1 from Italy	University of Pennsylvania: Wharton

The OECD Programme for International Students Assessment						
Source		Year	Scores	Rank	Reference Score	Top Performer
14	PISA – Reading (full research)	2003	476	25 out of 31	OECD Average 494	Finland 543
15	PISA – Reading (partial research)	2006	469	24 out of 31	OECD Average 492	Korea 556
16	PISA – Mathematics (full research)	2003	466 (together with Portugal)	27 out of 31	OECD Average 500	Finland 544

17	PISA Mathematics (partial research)	2006	462	28 out of 32	OECD Average 498	Finland 548
18	PISA –Science	2003	486	23 out of 31	OECD Average 500	Finland and Japan 548
19	PISA – Science (partial research)	2006	475	27 out of 32	OECD Average 500	Finland 563
20	PISA – Problem Solving	2003	-	31 out of 40	-	Korea

Source, OECD (2007a, 2007c, 2007d, 2008), Financial Times (2007, 2008), Eurostat Website, Institute of Higher Education, Shangai Jiao Tong University (2007), THES (2007), PISA (2004a, 2004b),

Indicators 1 to 7 give an overview of the country's educational investment and achievement at upper secondary and tertiary levels. Italy's is below the average of the reference group of countries in all indicators. Only in youth education attainment, the country is close to the average of EU 27 with 75.5% against 77.9% of population aged 20 to 24 with at least upper secondary education. Tertiary attainment is particularly weak with only 12% of the population aged 25 to 64 and 16% of the younger population aged 25 to 34. This is about half the OECD average of 26% and 32% respectively and places Italy towards the bottom of the league of 36 countries in 34th and 33rd places respectively. Life-long learning is also low in Italy with only 6.1% of the population aged 25 to 64 participating in education and training, whereas the average for the EU 27 is 9.6% and top performer Denmark reaches 29.2%

The next set of indicators confirm Italy's poor performance regarding both the international recognition of Italian universities and the performance of Italian students in the Programme of International Student Assessment (PISA). The indicators 8 to 13 in Table 4 show that the position of Italian universities in various world rankings leaves much to be desired. Thus, in the Times Higher Education's (THES) 2007 ranking of the world's top 200 universities, the first Italian university –University of Bologna- appears in position 173, with La Sapienza University of Rome in place 183. The same source ranks no Italian university within the top 50 Technology Universities and top 50 Science Universities. In turn, the 2007 ranking of the Shanghai Jiao Tong University places no Italian university within the top 100 world universities, although there are 3 –Milan University, Pisa University and La Sapienza Rome- inside the 102-159 range. Finally, the 2007 Financial Times rankings of top 50 Business Schools in Europe and top 100 full-time MBA programmes find only one Italian business school, SDA Bocconi, ranked 19 out of 60 and 48 out of 100 in the respective rankings. Not surprisingly the Nucleo Education Confindustria concluded in 2006: "The Italian university system is not competitive today."[8]

Finally, indicators 14 to 20 in Table 4 show the ranking emerged from the OECD international student assessment of 2003 and 2006. The 2003 assessment involved 15-year old secondary students and measured their performance in reading, mathematics, science and, also, in problem-solving an area of major importance in 21st century skills. The results were bad since in all categories the performance of Italian students was towards

8 *Translation of "Il sistema universitario italiano non è oggi competitivo." (Nucleo Education Confindustria, 2006, p.1)*

the last quarter of the ranking: 25 out of 31 in reading, 27 out of 31 in mathematics, 23 out of 31 in science and 31 out of 40 in problem solving. The 2006 PISA research did not address the area of problem-solving and involved fewer indicators than the PISA 2003. The results were equally poor for Italy, with rankings of 24 out of 31 in Reading, 28 out of 32 in Mathematics and 27 out of 32 in Science respectively. It must be noted however that there is a substantial disparity in the performances of the different regions of Italy, with the North's results in Reading being above the average and those of the South towards the bottom (De Mauro, 2008).

2.3 Inclusion in Italy

The third distinctive pillar of an inclusive knowledge society is *inclusion*. As with the other two pillars of *innovation* and *education*, Italy does not perform in correspondence with its status of 7th largest economy in the world. There are however a few areas in which the country does very well. One of them is life expectancy, as shown by indicators 1 and 2 of Table 5. Indeed, in 2005 Italian women could expect to live up to 83.2 years, ranking the country 6th out of 32 countries. In the same year, men's life expectancy was 77.6, placing Italy 8th out 32 countries and still above the OECD average of 75.7 years[9]. Italy also fared better than the OECD average in infant mortality with 4.7 against 5.5 deaths per 1000 live births, although Iceland's 2.3 is significantly better and 17 countries rank higher. Table 5 (indicator 4) shows that in 2003 Italy also performed slightly higher than the EU15 average for public social expenditure as percentage of GDP, gaining 8th place in a ranking of 30 countries.

9 According to ISTAT's estimations for the year 2007, in Italy life expectancy has increased to 84.1 years for women and to 78.6 years for men. The total resident population at 1st January 2007 was 59,131,287. ISTAT (2008)

Table 5. Various Indicators of Inclusion in Italy							
Indicator		*Year*	*Value*	*Rank*	*Reference*	*Top Performer*	*Worst Performer*
1	Life Expectancy at Birth – Females (number of years)	2005	83.2	6 out of 32	OECD Average 81.4	Japan. 85.5	Russian Federation 72.4
2	Life Expectancy at Birth – Males (number of years)	2005	77.6	8 out of 32	OECD Average 75.7	Iceland 79.2	Russian Federation 58.9
3	Infant Mortality (deaths per 1000 live births)	2005	4.7	18 out of 33	OECD average 5.5	Iceland 2.3	Brazil 25.8
4	Public Social Expenditure (% of GDP)	2003	24.2	8 out of 30	EU 15 average 23.9	Sweden 31.3	Korea 5.7
5	Income Inequality (ratio of total income received by 20% of population with highest income to that of 20% of population with lowest income)	2006	5.5	6 out of 29	EU 25 4.8	Denmark & Slovenia 3.4	Latvia 7.9
6	Poverty (Total population at risk of poverty after social transfers) %	2006	20	5 out of 29 (joint with Spain and Lithuania)	EU 25 16	Netherlands and Iceland 10	Latvia 23
7	Poverty (Female population at risk of poverty after social transfers) %	2006	21	2 out of 29	EU 25 17	Netherlands and Iceland 10	Latvia 25
8	Poverty (Male population at risk of poverty after social transfers) %	2006	18	6 out of 29	EU 25 15	Iceland amd Czeck Rep. 9	Latvia 21

9	Jobless Households (% of persons aged 18-59 who are living in households where no-one works)	2007	9.1	9 highest out of 24	EU 27 9.3	Cyprus 4.5	Belgium 12.5
10	Jobless Households – Females (% of women aged 18-59 who are living in households where no-one works)	2007	10.3	7 highest out of 24	EU 27 10.3	Cyprus 4.9	Belgium 14.4
11	Jobless Households – Males (% of men aged 18-59 who are living in households where no-one works)	2007	7.8	10 highest out of 24	EU 27 8.3	Cyprus 4.1	Belgium and Hungary 10.7
12	Total Unemployment Rates (as % of civilian labour force)	2006	6.8	14 highest out of 28	OECD Total 6.1	Korea and Norway. 3.5	Poland 13.8
13	Women Unemployment Rates (as % of female civilian labour force)	2006	8.8	10 highest out of 28	OECD Total 6.5	Korea 2.9	Poland 14.9
14	Men Unemployment Rates (as % of male civilian labour force)	2006	5.4	16 highest out of 28	OECD Total 5.9	Denmark 3.3	Poland 12.9
15	Human Development Index	2005		20 in the World		Iceland	
16	Human Poverty Index (HIP-2)	2005		Selected OECD countries 19 out of 19		Sweden	
17	Net Official Development Assistance (ODA) Disbursed (% of GNI)	2006	0.20	20 out of 22	OECD-DAC countries (Dev. Assistance Committee) 0.31	Sweden 1.02	Greece 0.17

Source. Eurostat (2008b), OECD (2007a, 2008) and UNDP (2007).

However, as we reach the index of inequality, poverty, jobless households and unemployment (indicators 6 to 14), Italy's performance deteriorates. Thus in 2006 Italy had the 6th highest inequality out of a group of 29 countries with the total income received by the 20% of population with highest income being 5.5 times that of the 20% of population with lowest income. For the EU25 this ratio was 4.8 times and for Denmark and Slovenia 3.4 times. Likewise, in 2006, the total Italian population at risk of poverty after social transfer amounted to 20%, the 5th highest in a group of 30 countries (along with Spain and Lithuania). Moreover indicators 7 and 8 show that the poverty risk affects much more Italian women than men. The female population at risk of poverty after social transfers was 21% against 18% for men. This disparity was reflected in Italy's rank of 2nd and 6th worst performer among a group of 29 countries respectively.

A slightly better message emerges from indicators 9 to 11 dealing with jobless households i.e., the share of persons aged 18-59 who are living in households where no-one works. In 2007, 9.1% of Italians aged 18-59 belonged to this category, the 9th highest out of 24 countries, although slightly better than the 9.3 average of EU27. Again however Italian women fared worst than men since the respective shares are 10.3% for women and 7.8% for men. This result placed Italy right on the average of the EU27 for women but better than the EU 27 average of 8.3 for men. This was reflected in the ranking, with women showing the 7th highest rate and men the 10th highest in the group of 24 countries. This pattern is confirmed by the country's total unemployment rates (indicators 12 to 14). In 2006, the share of Italian unemployed as percentage of the total civilian labour force was 6.8, ranking Italy with the 14th highest rate out of a group of 28 countries, far from the 3.5% rate of best performers Korea and Norway and below the OECD Total of 6.1%. For women however the unemployment rate in 2006 was 8.8% of the female civilian labour force against men's 5.4% of the male civilian labour force. This meant that while Italian women showed the 10th highest unemployment rate, men showed the 16th highest rate of the group of 28 countries. This result placed Italian women's unemployment rate above the OECD total of 6.5% while Italian men's unemployment rate was below the OECD total of 5.9%.

Finally, indicators 15 and 16 look at Italy's place in Human Development and Human Poverty for year 2005, while indicator 17 looks at its Net Official Development Assistance for 2006. Italy ranked 20 in the UNDP's world index of human development and last among a selected group of 19 OECD countries regarding the human poverty index. Italy's official development

assistance as percentage of GNI also ranked low, with the country's 0.2% occupying 20th place in the group of 22 DAC countries. This was less than the 0.31% average for the OECD-DAC countries and just about one fifth of the Sweden's ADA at 1.02%.

3 Conclusion

All in all, the data just presented lead to an unavoidable conclusion, namely, Italy faces widespread structural problems to advance towards an inclusive knowledge society. Italy is not yet able to break with a structural dynamics that is plainly failing to respond effectively to the challenges created by the primacy of knowledge, learning, ICTs, innovation, dynamic capabilities and globalization. Besides, these structural problems can hardly be faced piecemeal, that is, tackling one problem at the expense of others. *The need is for systemic change*, that is, change that tackles simultaneously all key aspects of the Italian society, to avoid blockages between them. It will take a profound effort from all Italians to take the country among the top performers of an inclusive knowledge society in the future.

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